Detecting and Exploiting Extremely Low Frequency Receiver Antennae Echo for Triangulation of Strategic Submarines Receiving ELF Transmissions

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Introduction

Strategic submarines are notoriously difficult to detect, particularly after they have reached their assigned loitering position off the coast of a strategically-important city. It is possible to communicate with submarines which are at substantial depth through the use of Extremely Low Frequency transmissions which readily penetrate the crust of the Earth as well as the water of the ocean.

Antennae of approximately 115 feet in length are used to send and receive signals on this band. Although bandwidth is extremely limited, this system of communication has, for decades, allowed for orders to surface to be transmitted to subs so that more detailed messages can be forwarded. Many nations operate strategic submarines capable of receiving communications on the ELF band and it is possible to attempt to jam the ELF band. Nevertheless, ELF is the standard for sending messages to submarines which are submerged.

Unlike with high-frequency electromagnetism, when longer antennae are struck with electromagnetism, they tend to reverberate and to, even when designed not to do so, re-transmit whatever signal is received at a reduced amplitude. This is the principle upon which the large transmitter antennae on the roofs of skyscrapers operate when reporters in the local area of the transmitter appear live on television. The news van has a microwave dish (not necessarily a satellite dish) and this microwave transmitter is used to direct a signal toward the antenna for the broadcast area. The power for the broadcast can be derived entirely from the microwave emitter, itself, although this signal is often amplified deliberately. This could be compared to lighting an entire room by shining LASER light upon a crystal in order to diffuse the light.

Abstract

In the case of a satellite truck operated by a news station, the operator *intends* to induce a remote antenna to re-broadcast a collimated beam over a vast area. In the case of an ELF antenna on a submarine, this is the last thing intended by the operators of the transmitters.

Despite the best intentions of the operators, an ELF receiver antenna on a submarine is necessarily always going to unintentionally re-transmit received signals due to the nature of how antennae work. The only question is as to the amplitude of this “echo” signal.

An ELF detector of sufficient sensitivity would be capable of triangulating, particularly in concert with multiple other detectors, the source of these

unintended echoes produced by the antennae on board the strategic submarines. As ELF transmission sites are well-known and closely monitored, the contents of transmissions and the timing of those transmissions are known quantities. This means that we would know when to listen and for what we should listen when it comes to these echoes. Naturally, we also have the option of introducing our own signals designed to bring about resonances at times of our choosing.

Sufficient detector sensitivity could be brought about through the chilling of the detectors and individual detectors could be used to perform the entire triangulatory function provided a precision timing capability.

Once the location of a strategic submarine has been ascertained, an attack submarine, perhaps featuring a helical-optical visual tracking system could track the location of the submarine as it changes and neutralize the targets before launch orders may be processed in the event of conflict. This strategy as has its advantage that the hostile strategic submarines would not be aware that they were detected and were being tracked.

Conclusion

In the future, our own submarines might be outfitted with non-traditional ELF antennae which are not prone to produce, to any extent, this echo for reason that the operative parts of the antenna are segregated rather than contiguous and are synthetic in their mode of operation, likely using the “perma-cold” cells previous circumscribed by this author. Superconducting antennae do not produce the undesired echo, notably, nor would a “whole” antennae provided it were superconducting. Such an antenna would be capable of receiving signals transmitted at a lower initial level of power than the previous standard. This would have the added benefit of allowing our own submarines to serve as detectors of this electromagnetic echo which is a much more sensible option for ELF antenna echo detection as, ultimately, they are physically closer to the source and more likely to be able to detect useful signals of this nature provided that detection mechanisms of comparable sensitivity may be deployed on the submarines.